

REMARKS

Claims 1, 4-10 and 16-27 are pending. Claims 1, 4, 5, 9, 10, 16 and 17 are amended. Claims 2, 3 and 11-15 are canceled. Claims 18-27 are newly added, but no new matter has been added thereby. Applicant requests reconsideration and reexamination of the pending claims.

Claims 16 and 17 are objected to for informalities. Claim 16 has been amended to make clear that Claim 16 is an independent claim. Claim 17 has been amended to depend from Claim 16. Claims 16 and 17 are now in condition for allowance. Claim 2 has been canceled and thus all rejections of Claim 2 are now moot.

White LEDs include a combination of LED chips which emit light of different colors. However, white LEDs have not yet been put into widespread use for lighting because of the large unevenness of color. Generally, LED chips are mounted on a printed-wiring board and inevitably arranged at large intervals, due to technical constraints in forming a wiring pattern by etching. As a result, the colors of light emitted from the LED chips do not mix together well.

Although the printed-wiring board may be replaced with, for example, an SiC substrate which has a wiring pattern formed in a wafer fabrication process, the step of mounting all of the LED chips is still required.

In the present invention, each semiconductor blue-light emitting element has an epitaxial structure. That is, the semiconductor blue-light emitting elements are formed integrally as an oriented overgrowth of crystalline material upon the surface of the substrate to form a single unit during manufacturing of the semiconductor substrate. This consequently allows the semiconductor light emitting elements to be arranged very densely on the substrate. Accordingly, it is not necessary for each semiconductor blue-light emitting element to be manually mounted (attached) onto the substrate. Advantageously, there is little likelihood of

misplacing each semiconductor blue-light emitting element with respect to the substrate, which could occur in a case where each semiconductor blue-light emitting element is being manually mounted onto the substrate.

As shown in FIG. 1A, the height of each semiconductor red-light emitting element from the substrate is greater than the height of each semiconductor blue-light emitting element from the substrate. Thus, each semiconductor red-light emitting element may be smoothly mounted onto the substrate, without the capillary interfering with adjacent semiconductor blue-light emitting elements. This improves the productivity of the semiconductor light emitting device.

Claims 1, 11, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Shimizu et al.* (U.S. Patent No. 6,577,073, hereinafter "*Shimizu*") in view of *Maeda et al.* (U.S. Patent No. 6,468,821, hereinafter "*Maeda*"). Claim 12 is rejected over *Shimizu* in view of *Maeda* when further taken in view of *Akutsu et al.* (U.S. Patent No. 4,047,069). Claims 2-6 are rejected as being obvious over *Shimizu* in view of *Maeda* when further taken in view of *Farrell* (U.S. Patent No. 4,857,801). Claim 7 is rejected as being obvious over the *Shimizu* reference in view of *Maeda*, *Farrell*, and the *Akutsu et al.* reference. Claim 8 is rejected over *Shimizu*, *Maeda*, *Farrell*, and *Slater, Jr. et al.* (U.S. Patent No. 6,740,906). Claims 9 and 10 are rejected over *Shimizu*, *Maeda*, *Farrell*, and *Matsuoka et al.* (U.S. Patent No. 6,927,426). Claim 15 is rejected over *Shimizu*, *Maeda*, when taken in view of *Marshall et al.* (U.S. Patent No. 6,692,136). Claims 16 and 17 are rejected over *Shimizu*, *Maeda*, when taken in view of *Wu* (U.S. Patent No. 6,502,956). Applicant overcomes the rejections as follows.

Claim 1 sets forth "a plurality of semiconductor blue-light emitting elements each having an epitaxial structure on the substrate." Applicant could find no teaching or suggestion of a blue-light emitting elements having an epitaxial structure in any of the cited references.

It is the Examiner's burden to establish *prima facie* obviousness. See *In re Rijckaert*, 9 F.3d 1531, 1532 (Fed. Cir. 1993) Obviousness requires a suggestion of all the elements in a claim (*CFMT, Inc. v. Yieldup Int'l Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003)) and "a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007).

Ex parte Karoleen B. Alexander, No. 2007-2698, slip op. at 6 (B.P.A.I. Nov. 30, 2007)

Shimizu discloses a semiconductor light emitting device comprising: a substrate 115; a semiconductor blue-light emitting element 111 mounted on the substrate 115; and a semiconductor red-light emitting element 112 mounted on the substrate 115 (*Shimizu*, column 21, lines 30-36; FIG. 17). Here, since *Shimizu* discloses that blue-light emitting element 112 is "mounted on the substrate 115" the reference does not provide a teaching or suggestion that would have prompted one of ordinary skill in the art to use "blue-light emitting elements each having an epitaxial structure" which do not require "mounting," but instead are grown on the substrate to form a single unit.

Maeda is cited for disclosing a semiconductor light emitting device, where a plurality of pairs of pads 25 are formed on a substrate 20A (FIG. 10B) and a plurality of flip-chip LEDs 1 are each mounted on a different one of the pairs of pads.

Farrell is cited as disclosing a semiconductor light emitting device, where a plurality of semiconductor green-light emitting elements 14b and a plurality of semiconductor red-light emitting elements 14a are mounted in a matrix on a substrate 12 (FIG. 4).

Applicant has reviewed *Maeda* and *Farrell* and could find no disclosure that teaches or suggests "blue-light emitting elements each having an epitaxial structure" on the substrate. In the cited reference, all the semiconductor light emitting elements are mounted (attached) onto the

substrate. Thus, the *Maeda* and *Farrell* references do not disclose that each semiconductor blue-light emitting element has an epitaxial structure on the substrate and therefore do not cure the deficiencies of *Shimizu*.

For that reason, any combination of the cited references cannot achieve the present invention. Hence, it is unreasonable to deem Claim 1 obvious in view of the cited references, and Claim 1 is patentable.

Independent Claim 16 includes the allowable features of Claim 1 and is therefore allowable for the same reasons as Claim 1.

Independent Claim 25 has been added to further capture the patentable subject matter of the present invention. Support for Claim 25 may be found throughout the specification and figures, thus no new matter has been added. For many of the reasons stated above, Claim 25 is not render obvious by the cited references and is therefore allowable.

Claims 4-10 depend from Claim 1 and are therefore allowable for at least the same reasons as Claim 1. Claims 17-24 depend from Claim 16 and are therefore allowable for at least the same reasons as Claim 16. Claims 26 and 27 depend from Claim 25 and are therefore allowable for at least the same reasons as Claim 25.

If there are any questions with regards to this matter the undersigned attorney can be contacted at the below listed telephone number.

Very truly yours,

SNELL & WILMER L.L.P.

A handwritten signature in black ink, appearing to read 'J. Price', is written over a horizontal line.

Joseph W. Price
Registration No. 25,124
600 Anton Boulevard, Suite 1400
Costa Mesa, CA 92626
Telephone: (714) 427-7420
Facsimile: (714) 427-7799